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THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Application of:)

Leonel Yanez MARTINEZ et al.)

Serial No. 10/613,433)

Filed: JULY 3, 2003)

Title: **DRY WATER RESISTANT
COAXIAL CABLE AND METHOD
OF MANUFACTURE THEREOF**)

Docket No. MX/JFServ-001)

Group Art Unit: 2831

Examiner: William Mayo II

APPELLANTS' BRIEF
UNDER 37 C.F.R. §41.37

Assistant Commissioner for Patents
Washington D.C. 20231

Sir:

This is in response to Notification of Non-Compliant dated December 10, 2009. The following is the Appellants' Brief pursuant to 37 C.F.R. §41.37.



TABLE OF CONTENTS

	Page
I. REAL PARTY IN INTEREST	1
II. RELATED APPEALS AND INTERFERENCES	1
III. STATUS OF CLAIMS	1
IV. STATUS OF AMENDMENTS	1
V. SUMMARY OF THE CLAIMED SUBJECT MATTER	1
VI. GROUNDS OF REJECTION TO BE REVIEWED ON APPEAL	3
VII. ARGUMENT	4
A. The rejection of the claims under 35 U.S.C. §112 as being indefinite should be reversed because the specification disclosure shows the claim limitations are definite	4
B. The rejection of the claims under 35 U.S.C. § 103 should be reversed because there are no references in the prior art that taken individually or together disclose all of the elements of the present invention, motivate or suggest the present invention, or provide a reasonable expectation of success	5
1. The rejection of the claims under 35 U.S.C. §103 should be withdrawn because the cited art does not suggest or motivate the claimed invention	24
a. The cited art fails to provide a motivation or suggestion because the invention contains elements nowhere found or suggested in the prior art	28
b. The cited art fails to provide a motivation or suggestion because teaches away from the claimed invention	28

MARTINEZ ET AL.
Serial No. 10/613,433



VIII	CLAIMS APPENDIX.....	34.
IX	EVIDENCE APPENDIX.....	35
X	RELATED PROCEEDING APPENDIX.....	35



I. REAL PARTY IN INTEREST

The real party in interest in the appeal is the assignee, Servicios Condumex S.A. de C.V.

II. RELATED APPEALS AND INTERFERENCES

There are no such appeals or interference which will directly affect or be directly affected by, or have a bearing on the Board's decision in this appeal.

III. STATUS OF CLAIMS

In a response filed on March 9, 2009, Claims 1-67 have been cancelled. Claims 68-77 were added. In the Office Action dated May 19, 2009, Claims 68-77 were subjected to a restriction requirement by the Examiner. The Examiner restricted Claims 68-75, directed to coaxial cable and Claims 76-77, directed to method for preparing coaxial cable. Appellants elected Claims 68-75 with traverse. The Examiner maintained the restriction requirement and withdrew them from consideration. Appellants petitioned the restriction requirement. The Examiner rejected Claims 68-77. For purposes of this Appeal, the claims on appeal are Claims 68-75.

A copy of the pending claims on appeal are set forth in the attached Appendix.

IV. STATUS OF AMENDMENTS

Earlier amendments, claims 68-77 filed on March 9, 2009, all prior to the final rejection have been entered. Claims 76-77 were subjected to a restriction requirement. Appellants elected Claims 68-75, directed to coaxial cables, with traverse. Claims 76-77 were withdrawn from consideration. (A Petition to withdraw Finality of Restriction requirement was filed.)

V. SUMMARY OF CLAIMED SUBJECT MATTER

In its broadest scope, Appellants' invention relates to a dry, water resistant coaxial cable (10) (Figs 1-2; page 3, lines 1-13; 20; page 5, lines 4-11) consisting of:
a metal core conductor element (11); (Figs 1-2; page 3, lines 1-9; 21; page 5, lines 12-18)
a dielectric element around the core conductor based on three layers,
the first layer (12) (Figs 1-2; page 3, lines 1-9; 14-25; page 5, lines 19-25 to page 6, lines 1-6;

page 8, lines 24-25 to page 9, lines 1-6) being applied onto the conductor as a uniformly thick film based on low density polyethylene mixed with a vinyl or acrylic adhesive (page 3, line 25 to page 4, lines 1-3; lines, 11-13; page 6, lines 3-5; page 8, lines 20-23; page 10, lines 1-5), the second layer (13) (Figs 1-2; page 3, lines 1-9; page 6, lines 6-16; page 9, lines 14-20; page 10, lines 1-5) being based on an expanded polyethylene mix consisting of low density polyethylene or mixture of low, medium and high density polyethylenes (page 13, lines 12-14; lines 21-23) and a swelling agent selected from azodicarbonamide, p-toluene sulphonylhydrazide, or 5-phenyltetrazol, (page 4, lines 7-9; page 6, lines 14-16; page 9, lines 10-12) and optionally, a reinforcement layer (14) (Figs 1-2; page 3, lines 1-9; page 6, lines 16-25; page 9, lines 17-20) of the same characteristics as the first layer (12) (Figs 1-2; page 3, lines 1-9; page 13, lines 18-21); wherein it has a second external conductor element (15) (Figs 1-2, 4; page 3, lines 1-9; 14; page 4, lines 16-25; page 6, line 25 to page 7, lines 1-7; page 12, lines 3-7; page 14, lines 1-4) formed by a tape made of an aluminum or copper alloy or combined with other elements (page 4, lines 17-19; page 5, lines 13-15; page 10, lines 14-16) and surrounding said conductor consisting of a water penetration protective element (16) (Figs 1-2, 4; page 3, lines 1-9; page 7, lines 8-15; page 12, lines 3-7; 9-10; page 14, lines 6-7) keeping it dry and based on one or several swellable fibers or tapes formed by polyester threads or other swellable fibers (Figs. 1-4; page 3, lines 1-9; page 10, lines 17-21; page 12, lines 5-9); and the protective cover (17) (Figs 1-2, 4; page 3, lines 1-9; 15; page 3, line 25 to page 4, lines 1-3; page 7, lines 16-25 to page 8, lines 1-3; page 12, lines 11-17) based on low, medium, high density polyethylene or a combination thereof (page 4, line 25 to page 5, lines 1-3).

Claim 69 The dry coaxial cable according to claim 68 wherein the core conductor is copper plated aluminum wire, with a uniform circular cross section of 3.15 ± 0.03 mm diameter. (Specification, page 13, lines 1-4).

Claim 70 The dry coaxial cable according to claim 68 wherein the adhesive component is chosen between ethylene acrylate acid or ethylene vinyl acid permitting better adherence and water resistance between the core conductor and the dielectric element. (Specification, page 3, lines 23-25; page 4, lines 9-15; page 6, lines 3-12; 20-25)

Claim 71 The dry coaxial cable according to claim 68 wherein the second polyethylene film applied onto the core conductor shows better watertightness to the swellable dielectric improves its superficial appearance and offers a 13.0 ± 0.10 mm diameter. (Specification, page 13, lines 16-17)

Claim 72 The dry coaxial cable according to claim 68 wherein the external conductor is formed by a tape made of aluminum or copper alloy or mixture thereof is formed in a cylindrical pipe and can be longitudinally welded, extruded or the edges can be overlapped and it has a thickness of 0.34 mm and the diameter on the pipe is 13.7 ± 0.10 mm diameter. (Specification, page 4, lines 16-20; page 14, lines 1-4).

Claim 73 The dry coaxial cable according to claim 68 wherein the water penetration protective element consists of swellable tapes placed helically, annularly or longitudinally. (Specification, page 3, lines 15-19; page 4, lines 20-25; page 12, lines 4-9).

Claim 74 The dry coaxial cable according to claim 73 wherein the moisture protection elements have an adsorption speed of ≥ 15 ml/g per minute and their absorption capacity is over 30 ml/g. (Specification, page 14, lines 5-9)

Claim 75 The dry coaxial cable according to claim 68 wherein the external cover is made of medium density polyethylene and has a diameter on cover of $15.5 \text{ mm} \pm 0.10 \text{ mm}$ with a $0.67 \text{ mm} \pm 0.02 \text{ mm}$ thickness. (Specification, page 14, lines 17-18).

VI. GROUND OF REJECTION TO BE REVIEWED ON APPEAL

The issue on appeal are:

- a) Whether or not Claims 71-72, 74 and 75 are properly rejected as being indefinite under 35 U.S.C. §112.
- b) Whether or not Claims 68-75, directed to dry, resistant coaxial cable were properly rejected as being unpatentable under 35 U.S.C. §103(a) over Chan et al. (U.S.

5,486,648) in view of Goehlich (U.S. 6,784,371) and further in view of Belli (U.S. 6,455,769).

- c) Whether or not each of Claim 68, 69, 70, 71, 72, 73, 74 and 75 was properly rejected as being unpatentable under 35 U.S.C. §103(a) over Chan et al. (U.S. 5,486,648) in view of Goehlich (U.S. 6,784,371) and further in view of Belli (U.S. 6,455,769).

VII ARGUMENT

A. The rejection of the claims under 35 U.S.C. §112 as being indefinite should be reversed because the specification disclosure shows the claim limitations are definite.

The claims do not stand or fall together. For purposes of 35 U.S.C. § 112, each of Claim 71, Claim 72, Claim 74, and Claim 75 stands apart from each other.

It is submitted that the "second polyethylene film" in Claim 71 is definite. In this regard, Claim 68 recited that the second polyethylene film as the reinforcement layer with same characteristics as the 1st layer. The specification provided that "the diameter of the third layer is similar to 1st layer with a 13.0 ± 0.10 mm dia." See page 4, lines 14-16; page 6, lines 17-25; page 13, lines 15-24.

It is submitted that the "external conductor" in Claim 72 is definite. In this regard, Claim 72 recited the external conductor is formed by tape made of an aluminum or copper alloy or combined with other elements." The specification provided that "the external conductor has a thickness of 0.34 mm and 13.7 ± 0.1 mm dia." See page 4, lines 17-20; page 6, line 25 to page 7, lines 1-8; page 14, lines 3-5.

It is submitted that the "moisture protection elements" in Claim 74 is definite. In this regard, Claim 74 recited the "moisture protection elements" have an absorption speed of > 15 ml/g per minute and their absorption capacity is over 30 ml/g. The specification provided that the water penetration protective element has an absorption speed is > 15 ml/g per minute and the absorption capacity is over 30 ml/g. Moreover, the specification provided that the water penetration protective element 16 is applied helically, annularly or longitudinally. See page 4, lines 22-24; page 7, lines 8-15; and page 14, lines 5-9.

It is submitted that the "external cover" in Claim 75 is definite. In this regard, Claim 75 recited the protective cover is based on low, medium, high density polyethylene or a combination thereof. The specification provided that the cover is 15.5 mm \pm 0.10 mm with 0.67 mm \pm 0.02 mm thickness. See page 4, lines 25 to page 5, lines 1-3; page 7, lines 16-25; and page 14, lines 17-18.

Applicants submit that claim indefiniteness is analyzed "*not in a vacuum*, but always in light of the teachings of the prior art and of the particular application disclosure as it would be interpreted by a person possessing the ordinary level of skill in the pertinent art (POSA);" the failure to **provide explicit antecedent basis for a term does not always render the claim indefinite**. *Energizer Holdings, Inc. v. TTC*, 11 USPQ 2d 1625 (Fed. Cir.2006) quoting *In re Moore*, 169 USPQ 236 (CCPA 1971). A claim containing terms which are seemingly vague is not indefinite if it is **precise when read in the context of the specification**. *Charvat v. Comnr. Pats.*, 182 USPQ 577 (1974).

Appellants submit that the Examiner has not established a *prima facie* case of indefiniteness under 35 U.S.C. 112 because there is literal support in the specification for the claims. The burden is on the Patent Office to establish *prima facie* case that the indefiniteness requirement has not been met. The Examiner has the initial burden of presenting reasons or evidence supporting his position that the skilled artisan would not recognize the claimed invention in the specification. *Ex parte Sorensen*, 3 USPQ 2nd 1462, 1463 (BPAI 1987) citing *In re Wertheim*, 541 F.2d 257 (CCPA 1976)

From the above, in light of the disclosure of the terms in the specification, it is submitted that the limitations are definite. Appellants request that the Examiner's objections be withdrawn.

35 U.S.C. 103

B. The rejection of the claims under 35 U.S.C. § 103 should be reversed because there are no references in the prior art that taken individually or together disclose all of the elements of the present invention, motivate or suggest the present invention, or provide a reasonable expectation of success.

The claims do not stand or fall together. For purposes of 35 U.S.C. §103, each of Claim 68, Claim 69, Claim 70, Claim 71, Claim 72, Claim 73, Claim 74, and Claim 75 stands apart from each other.

I TRANSITIONAL PHRASE "CONSISTING OF"

It is submitted that the Examiner incorrectly interpreted the claim language of the presently claimed invention by ignoring the fact that Appellants have amended the transitional phrase of Claim 68 to "*closed-ended*" language, "consisting of." The Examiner failed to consider all of the claim limitations in the Appellants' dry water resistant coaxial cable. It is submitted that these limitations are an objective indicia of **non-obviousness**.

MPEP §2111.03 provides that transitional phrase "consisting of" excludes any element, step, or ingredient *not* specified in the claim. *In re Gray*, 53 F.2d 520, 11 USPQ 255 (CCPA 1931); *Ex parte Davis*, 80 USPQ 448, 450 (Bd. App. 1948) ("consisting of" defined as "closing the claim to the inclusion of materials other than those recited except for impurities ordinarily associated therewith.").

The claims are explicitly limited in that no other component can be included in the coaxial cable. "Consisting of" is a term of patent convention meaning the claimed invention contains only what is expressly set forth in the claim. *Vehicular Techs Corp. v. Titan Wheel Int'l. Inc.*, 212 F.3d 1377, 1382-83 (Fed. Cir. 2000). "Consisting of" as used in the claims of the presently claimed invention limits the coaxial cable to claimed elements.

Broad claim 68 recites a dry, water resistant coaxial cable "**consisting of**": a metal core conductor element, a dielectric element around the core conductor based on three layers,

the *first layer* being applied onto the conductor as a uniformly thick film based on low density polyethylene mixed with a vinyl or acrylic *adhesive*,

the *second layer* being based on an expanded polyethylene mix consisting of low density polyethylene or mixture of low, medium and high density polyethylenes and a *swelling agent* selected from azodicarbonamide, p-toluene sulphonylhydrazide, or 5-phenyltetrazol, and

optionally a *reinforcement layer* of the same characteristics as the first layer; wherein it has a second external conductor element formed by a tape made of an aluminum or copper alloy or combined with other elements and surrounding said conductor **consisting of** a water penetration protective element keeping it dry and based on one or several swellable fibers or tapes formed by polyester threads or other swellable fibers; and the protective cover based on low, medium, high density polyethylene or a combination thereof.

Applying the above case laws to the present invention, it is submitted that the presently claimed invention is narrowed and limits the scope of the claims due to the transitional phrase

“consisting of.” It is submitted that the phrase “consisting of” *narrows* the scope of the presently claimed invention. The claims directed to dry coaxial cable and manufacturing method thereof are narrowed to the recited elements or embodiments (or steps) and nothing more.

Appellants submit that the introduction of other components or additional steps would materially change the characteristics or properties of the presently claimed invention. *In re De Lajarte*, 337 F.2d 870, 143 USPQ 256 (CCPA 1964). See also *Ex parte Hoffman*, 12 USPQ2d 1061, 1063-64 (BPAI1989).

In contrast, the term “comprising” is “open ended” or inclusive. In effect, comprising is a shorthand way of saying “including the following elements but not excluding others.” For example, a claim to a combination comprising A + B covers a combination having A + B + C. The term “consisting of” is a closed term. Thus, a combination consisting of A + B does not cover the combination A + B + C. **A closed language excludes more than traces of other ingredients.**

Appellants have compared and identified the elements that are required in the presently claimed invention and the cited prior art. See attached Table.

The cited prior art Goehlich (U.S. 6,784,371) and Belli (U.S. 6,455,769) used transitional phrase “comprising” which is open ended and inclusive.

Similarly, Chan et al. (U.S. 5,486,648) employs the transitional phrase “*having*.” Case laws have interpreted the term “having” as “open terminology, “allowing the inclusion of other components in addition to those recited;” *Crystal Semiconductor Corp. v. TriTech Microelectronics Int’l Inc.*, 246 F.3d 1336, 1348, 57 USPQ2d 1953, 1959 (Fed. Cir. 2001). Transitional phrases such as “having” must be interpreted in light of the specification to determine whether open or closed claim language is intended. See, e.g., *Lampi Corp. V. American Power Products Inc.*, 228 F.3d 1365, 1376, 56 USPQ2d 1445, 1453 (Fed. Cir. 2000). In light of the specification, it is submitted that Chan et al. intended the claims and disclosure to be open ended or inclusive, i.e., different variations, combinations and embodiments were intended.

Broad claim 1 of Chan et al. recite a cable “having” concentric neutral wires (CN) wires applied over a cable construction extending in a longitudinal direction to provide a metallic ground shield and having protective polymeric jacket over said concentric neutral wires characterized in that at least one continuous elongated water swellable element.

The claim of Belli (U.S. 6,455,769) recited an electrical cable “comprising”: conductor (1); at least one insulating layer (3); outer metal shield (6) and a layer of expanded polymer material (5) placed under metal shield; characterized in that the layer of expanded polymer

material is semiconductive and includes water swellable material wherein the expanded layer material has a degree of expansion between 5% and 500%.

Claim 2 Cable according to Claim 1 wherein expanded layer has a **predetermined degree of expansion**

The broad claim of Goehlich (U.S. 6,784,371) recited a cable “**comprising**” a cable core (1); an inner cable sheath (2); outer cable sheath (3); sensor (4) and a structured material between inner cable sheath and outer sheath arranged to allow any detectable substance entering between the inner cable sheath and outer cable sheath travel along the perimeter of inner cable sheath to reach sensor.

II. UNOBVIOUSNESS OF THE APPELLANTS' CLAIMS

As discussed above, the claims have been amended to “consisting of” which excludes several limitations disclosed in the cited prior art. Appellants submit that the structure, design, diameter, material, cable configuration, order of position and layering of the respective components and properties of the presently claimed dry, water resistant coaxial cable are different and unobvious over the cited prior art. For example, the use of low, medium, or high density polyethylene (LDPE, MDPE, HDPE); specific adhesives, swelling agents; the coating and layering of the area around the thin sleeve and the core of stranded conductors; the deposit of the swelling material in a quantity that is proportional to the required thickness of the said film are required to achieve the dry, water resistant cable of the present invention.

Chan et al. (U.S. 5486648)

First, the key requirement of Chan et al. is the presence of a “plurality of” of concentric neutral wires (CN) in its cable to prevent water penetration. Note col. 1, lines 5-15; lines 55-58. The disclosure of Chan made it clear that “plurality of” CN wires was an essential element and properties of the cable would be materially and significantly affected if the “plurality of” CN wires were modified or deleted. Moreover, it is submitted that Chan intended that “plurality of” CN wires provide the improved protection against migration of water and didn’t need any other improvement. See col. 1, lines 9-12; col. 2, lines, 45-50. It is submitted that a “plurality of” CN wires was not encompassed in Appellants’ cable. In addition, the properties of the dry, water resistant cable of the present invention would not be affected if the “plurality of” CN wires was

not incorporated as part of the cable.

A person of ordinary skill in the art (POSA) familiar with the problems of water penetration in cables understood that "plurality of" CN wires are not equivalent to or could not be incorporated or substituted for the external conductor (15) of the present invention because the transitional phrase "consisting of" did not allow for the presence of "plurality of" CN wires. The "comprising" language in Chan provided "plurality of" CN wires and other elements in different variations and embodiments in combination with the water swellable elements, the combinations of which were not allowed in Appellants' cable.

In this regard, the Examiner *ignored* the transitional phrase "consisting of." The scope of the claims is *limited* to the designated elements, configuration or material of the presently claimed dry, water resistant coaxial cable, as well as the order of the position of each of the elements as recited and nothing more.

Second, the semi-conductor shield layer (2) of Chan required polymeric compounds such as crosslinked polyolefin (XLPE),¹ ethylene propylene rubber (EPR) or ethylene vinyl acetate (EVA). Note col. 4, line 26 of Chan. In contrast, the structure of Appellants' cable required low density polyethylene (LDPE)² These materials are different in function and properties. It is submitted that crosslinked polyolefin (XLPE), EPR or EVA of Chan are not functionally equivalent to LDPE of the presently claimed invention. Moreover, it is submitted that the use of XLPE of Chan which is thermoplastic rubber is fundamentally different and cannot be substituted for LDPE and achieve the resulting product of the present invention. Similarly, the properties of the dry, water resistant cable of the presently claimed invention would not be significantly affected if XLPE, EVA or EPR were not employed, whereas the properties of Chan et al. would be materially affected.

Third, Chan required the use of water swellable element WSE (5) such as yarn, filament,

¹ XLPE a medium- to high-density polyethylene containing cross-link bonds introduced into the polymer structure, changing the thermoplastic into an elastomer. The high-temperature properties of the polymer are improved, its flow is reduced and its chemical resistance is enhanced. In polymer chemistry, when a synthetic polymer is said to be "crosslinked", it usually means that the entire bulk of the polymer has been exposed to the crosslinking method. See www.wikipedia.org/wiki/XLPE.

² LDPE is defined by a density range of 0.910-0.940 g/cm³ LDPE has a high degree of short and long chain branching, which means that the chains do not pack into the crystal structure as well. It has, therefore, less strong intermolecular forces as the instantaneous-dipole induced-dipole attraction is less. This results in a lower tensile strength and increased ductility. LDPE is created by free radical polymerization. The high degree of branching with long chains gives molten LDPE unique and desirable flow properties. See www.wikipedia.org/wiki/LDPE

strand or strip in combination with swelling agent such as polyacrylamide, starch graft copolymer of polyacrylic acid, and carboxy methylcellulose. Chan required that WSE (5) is in *contact* with the “plurality of” CN wires in order to block the passage of water within the cable in the longitudinal direction. The WSE employed are starch graft copolymer of polyacrylic acid or carboxymethylcellulose.³ The functional group in polyacrylic is **acyl group** while in polyester, the functional group is an **ester group**. In addition, starch and carboxymethylcellulose are classified as polysaccharides. Thus, besides being classified as polysaccharides, having different functional group and different form, i.e., *yarn, filament, strip or strand* from polyester tapes or fibers of the presently claimed invention. It is submitted that carboxymethyl cellulose (CMC) is a cellulose derivative with carboxymethyl groups bound to some of the hydroxyl groups of the glucopyranose monomers that make up the cellulose backbone. The polysaccharides or polyacrylic are **not functionally equivalent** to the polyester material of the presently claimed invention.

The Examiner proposes that Chan et al.’s polysaccharide copolymers in the form of yarn, filament, strip or strand and in contact with the “plurality of” CN wires can be employed and achieve the dry, water resistant cable of the presently claimed invention.

Appellants disagree. It is submitted that it is highly unlikely that one of ordinary skill in the art would substitute a polyester fiber or tape for the polysaccharide filament, strips or yarn of Chan et al.

Thus, Chan taught away from the present invention because the Appellants’ cable required the use of polyester fibers or tapes for water protection element (16). Chan employs starch graft copolymer of polyacrylic acid, carboxymethylcellulose yarns, filament or strip in order to maintain contact with insulation shield. Note col. 3, lines 56-63. Moreover, the Appellants’ cable employ

Moreover, Chan taught away from the presently claimed invention because it avoids the use of tapes for its water swellable elements. For example, Chan discloses at col. 2, lines 21-26 as follows:

The use of a layer of water swellable tape over the length of the cable increases the overall diameter and weight of the cable which in many instances, is **undesirable**. Also the **cost associated with the application of water swellable tape and powder is significant and will translate**

³ Starch and carboxymethylcellulose are classified as “polysachharide” and are linked through glycosidic linkages. The functional group of polyacrylic acid is an acyl group while in polyester, the functional group is an ester group. These functional groups and classification are not equivalent.

into a higher cost of the cable.

Further, Chan discloses at col. 3, lines 55-64 as follows:

“...The water swellable element, such as **yarn, filament strand or strip** may be non-conductive or semi-conductive. The reason for which it can be non-conductive is that CN wires will still maintain a substantial (over 90%) contact with semi-conductive insulation shield of the cable core on which the CN wires are applied. ***This is different from the use of tape*** covering entire cable core and which must be semi-conductive to maintain such electrical contact....”

In addition, Chan further discloses at col. 6, lines 14-17 as follows:

“...Moreover, the arrangement according to the invention **provides an improved construction in relation to the one that would use only tapes** over the entire length of the cable...”

From the above, Appellants submit that Chan taught away from the use of water swellable tapes of the presently claimed invention, Chan uses water swellable yarns or fibers.

Finally, because of the transitional phrase in Chan, the claims allow WSE in various configuration and embodiments with “plurality of”CN wires and cable. For example, a) WSE can be helically wound around the core construction under “plurality of”CN wires with a lay opposite that of “plurality of”CN wires. See Fig. 1 (best longitudinal effectiveness) Note col. 3, lines 5-9; b) WSE may be helically wound over the “plurality of”CN wires with a lay opposite that of “plurality of”CN wires. See Fig. 3; c) WSE can be helically wound under and over the “plurality of”CN wires with a lay opposite that of “plurality of”CN wires. See Fig. 4; d) WSE can be helically wound under the “plurality of”CN wires with a direction opposite and the same as that of “plurality of”CN wires. See Fig. 5; e) WSE can be helically wound around each CN wires. See Fig. 6; f) WSE can be helically wound around the core of cable under the “plurality of”CN wires in opposite direction to that of CN wires and other yarns wound around each CN wires. See Fig. 7; g) WSE may be applied over the “plurality of”CN wires and at least one wound around cable and under “plurality of”CN wires. See Fig. 8.

In summary, it is submitted that these embodiments are not encompassed by the presently claimed invention. It is submitted that the transitional phrase “consisting of”, the arrangement of the elements of the cable in a particular sequence, the use of polyester, the properties, configuration and manner of layering of the components of the cable of the presently claimed invention are totally different from that of Chan et al. It is submitted that the use of a

“plurality of” CN wires was not encompassed by the presently claimed invention. It is submitted that the XLPE is not functionally equivalent to LDPE. Moreover, as discussed above, WSE yarns listed in Chan is not functionally equivalent to the polyester tapes of the presently claimed invention.

Goehlich (U.S. 6,784,371)

First, Goehlich is directed to power cables “comprising” a cable core, inner cable sheath, an outer sheath and a sensor. The claim of Goehlich is open ended. The configuration and properties of Goehlich’s cable are totally different from the configuration and properties of the Appellants’ dry water resistant cable. Goehlich required a sensor for detecting a detectable substance inside the cable. In contrast, the Appellants’ cable does not require a sensor. The object of the Appellants’ present invention is to improve dielectric surface appearance and permit better control of the dielectric swelling process.

Second, Goehlich required a “structured material” (SM) between the inner cable sheath and the outer sheath. Moreover, the disclosed “structured material” of Goehlich is from an **infinite list** of swellable material; self adhesive; tape combination; sputtered tape; stripe shaped tape; or sealing material, etc. Note cols. 4-6. However, of this **infinite list**, Goehlich examples or preferred embodiments demonstrate the use of either “self adhesive” or “one strip shaped sputtered adhesives”, *alone or by itself*. There is no guidance in Goehlich on which “structured material” should be selected by one of ordinary skill in the art.

In contrast, the cable of the presently claimed invention employs a first layer (12) of low density polyethylene in combination or mixed with vinyl or acrylic adhesive. This property of polyethylene adhesive combination is an important and unobvious difference from the Goehlich disclosure.

The Examiner alleged that it would be obvious to use the adhesive of Goehlich in the cable of Chan et al. and arrive at the presently claimed invention. The present invention involved a chemical mixing of polyethylene and adhesive. It is submitted that it is not a matter of applying a film of adhesive on a plastic sheath as employed in Goehlich which is a *physical change*.⁴

⁴ Physical change is totally different from chemical change. Chemical change involves breaking chemical bonds, whereas physical change does not break chemical bonds.

It is submitted that the 1st or 3rd layer is made of polyethylene, wherein the film is thin, continuous and homogeneous; and the material is mixed with an adhesive selected from a group consisting of vinyl adhesive or acrylic adhesive. The film has low dielectric coefficient in order to have maximum signal propagation and minimum attenuation. The polymer has to be *thin* as possible to maintain transmission characteristics but its application onto the core conductor has to be *continuous and homogeneous* because otherwise electric problems will occur such as cable signal reflection. The main function of these layers is to protect core conductor against corrosion and control adherence between the core and dielectric.

Where the prior art does not show a reason or motivation to make the necessary changes in the prior art compound to achieve the claimed compound, a *prima facie* case of obviousness will generally fail. *Yamanouchi Pharmaceutical Co. v. Danbury Pharmacal, Inc.*, 231 F.3d 1339 (Fed. Cir. 2000).

It is submitted that there is no motivation or suggestion to one of ordinary skill in the art to *modify* the cable of Chan which employs “a plurality of” CN wires, XLPE, a thermoplastic elastomer and mixed with an adhesive from the infinite list of “structured material” listed in Goehlich. There is no guidance to one of ordinary skill in the art on how to pick and choose which “structured material” would be suitable for use with XLPE, thermoplastic elastomer of Chan et al. There is no suggestion to one of ordinary skill in the art that there is a reasonable expectation that the presently claimed invention would be achieved. More particularly, the properties of presently claimed invention would not changed even if the cable excludes “a plurality of” CN wires of Chan et al. or sensor of Goehlich. Moreover, the presently claimed invention employs LDPE (polyethylene) mixed with vinyl or acrylic adhesive and *nothing more*. Chan encompasses several broad embodiments of “plurality of” CN wires with an infinite list of “water swellable elements”

It is submitted that the Examiner has not identified reasons which would have led one of ordinary skill in the art to *modify* known cable in particular manner to establish *prima facie* obviousness of a new claimed cable. If the prior art fails to suggest precise changes required to obtain the claimed cable, the prior art should not provide a motivation to combine. The fact that any changes to the steps required to modify the prior art into the claimed compound yield

compounds of inferior activity can show modification was not obvious. *Takeda Chem. Industries Ltd. V. Alphapharm Pty, Ltd*, 492 F.3d 1350 (Fed. Cir. 2007)

Third, the object of Goehlich is to provide a cable which is used for *detecting* water in the interstices between the outer sheath and inner sheath. It required interstice configuration by the sensor and structured material. The sensor was not required in the presently claimed invention.

Again, it is submitted that the configuration, materials and structure of Appellants' cable are different and unobvious over Goehlich.

The Examiner conceded that there is no disclosure of 1st layer containing adhesive in Chan. See page 6, 1st par; page 15, 1st par. of OA. The Examiner alleged that a POSA would modify Chan with the adhesive of Goehlich in order to achieve the 1st layer containing adhesive of the Appellants' cable.

However, as discussed above, Goehlich disclosed: a) the use of adhesives from an **infinite** list of "structured material" Note cols. 4-6. There is no motivation or suggestion in the prior art to "**pick and choose**" an adhesive from a multitude of element configuration and then particularly use it for the purpose of obtaining the Appellants' cable. *In re Albrecht*, 435 F.2d 908,911, 168 USPQ 293,296 (CCPA 1971); There is no guidance in Goehlich a person of ordinary skill in the art would use for a "**structured material**". There is no guidance in Goehlich whether an "adhesive" or "swelling agents" should be used as "**structured material**". In one embodiment, Goehlich used sputtered adhesive and sealing material. In another embodiment, a swellable material was used, in another embodiment, a self adhesive material was used. In addition, the adhesive of Goehlich was applied by itself as a film on the sheath. There is no motivation or suggestion in the prior art on which "structured material" should be selected by one of ordinary skill in the art. Thus, from the above, one of ordinary skill in the art would not be motivated to "pick and choose" an adhesive such as vinyl or acrylic adhesive of the presently claimed invention. There is no motivation or suggestion to one of ordinary skill in the art to mix the adhesive with low density polyethylene and achieve the presently claimed invention.

When what would have been "**obvious to try**" would have been to vary all parameters or try each of the numerous possible choices until one possibly arrived at a successful result, where the prior art gave either no indication of which parameters were critical or no direction as to which of the many possible choices is likely to be successful, **an invention would not have been obvious**. *In re O'Farrell*, 853 F.2d 894, 903 (Fed. Cir. 1988).

It is impermissible to use the claimed invention as an instruction manual or "template" to piece

together the teachings of the prior art so that the claimed invention is rendered obvious. "[one] cannot use hindsight reconstruction to pick and choose among isolated disclosures in the prior art to deprecate the claimed invention. *In re Fritch*, 23 USPQ 2d 1780 (Fed. Cir. 1992).

Belli et al. (U.S. 6,455,769)

First, the claims of Belli use "comprises" language (open ended) and required an "expanded layer" which has a degree of expansion between 5% and 500%, preferably from 10% to 200%. This elemental property which is critical to Belli is **not** encompassed by the Appellants' cable. There is no requirement of "expanded layer" which has a degree of expansion between 5% and 500%, preferably from 10% to 200% in the presently claimed invention. The properties of the dry, water resistant cable would not be materially altered if this structure was omitted. The degree of expansion of the expanded layer according to Belli varies and depends on both the specific polymer material used and on the thickness of the coating which it is intended to obtain. The degree of expansion is *predetermined* to ensure that the radial forces of thermal expansion and contraction of the cable are elastically absorbed and simultaneously, so as to maintain the semiconductive properties of the cable. Note Claim 2 and col. 2, lines 52-64; col. 3, lines 25-65. It is submitted that the presently claimed invention is different and unobvious over Belli et al.

Second, "Expanded polymer material" refers to a polymer material with a predetermined percentage of "free" space inside the material, i.e. of space not occupied by the polymer but by a gas or air. Col. 3, lines 33-38. In accordance with the claim limitation of the presently claimed invention, it is submitted that this polymer material is excluded from the presently claimed invention. Similarly, the "Expanded polymer material" is selected from a broad list of polymers which can turn into an **infinite** list of polymers (hundreds of millions of polymers); Note Cols. 4-6. As discussed above, there was no guidance in Belli to one of ordinary skill in art which "expanded polymer" should be picked and selected, which was critical from all the **infinite** possible choices.

Third, the expanded polymer is greater than the inside diameter of the metal shield. This is an important property in order to achieve a predetermined degree of precompression of the expanded layer, resulting in an optimum contact between expanded layer and metal shield. Note Col. 7, lines 43-55.

Fourth, Belli employs fillers in combination with polymer which Appellants' dry water resistant cable avoids.

The Appellants' specification on page 1, lines 20-25 to page 2, lines 1-4, discloses as follows:

....The current methods to prevent water penetration in this type of cables [coaxial cables] focus on the use of fillers such as oil dispersed water insoluble materials and stabilizers based on glycol, ester acetate, ethylene glycol, ester or ethylene glycol ester acetate. All these materials show an adequate water protection, the materials have oily adhesive and or characteristic properties. This complicates the use of solvents to clean the cable before connecting it.....

In avoiding the preceding prior art problems, Appellants provide on page 2, lines 21-25, a technique through the design of a dry, water resistant coaxial cable, i.e., **without** a filler. Rather, a water penetration protection element is incorporated which permits installation, preparation and connection of the coaxial cable in the absence of using solvents or other cleaning agents. The water penetration prevention element is between the second external conductor 15 (made of metal or combination thereof) and protective cover 17.

The Examiner conceded that Chan does not disclose 1st layer mixed with vinyl or acrylic adhesive. (Claim 68); nor the adhesive selected from ethylene component chosen between ethylene acrylate acid or ethylene vinyl acid (Claim 70); nor the absorption speed of 15 ml/mg/min and absorption capacity of more than 30 ml/g (Claim 74); Note page 6, 1st par. to page 7, lines 1-3 Of OA dated May 19, 2009.

The Examiner further conceded that there is no disclosure in Chan regarding the 2nd layer with swelling agent; swelling agent selected from azodicarbonamide, p-toluene sulphonylhydrazide, or 5-phenyltetrazol (**Claim 68**); nor the second polyethylene film applied onto the core conductor shows better watertightness to the swellable dielectric improves its superficial appearance and offers a 13.0 ± 0.10 mm diameter. (**Claim 71**); nor the external conductor is formed by a tape made of aluminum or copper alloy or mixture thereof is formed in a cylindrical pipe and can be longitudinally welded, extruded or the edges can be overlapped and it has a thickness of 0.34 mm and the diameter on the pipe is 13.7 ± 0.10 mm diameter (**Claim 72**); nor the external cover is made of medium density polyethylene and has a diameter on cover of $15.5 \text{ mm} \pm 0.10 \text{ mm}$ with a $0.67 \text{ mm} \pm 0.02 \text{ mm}$ thickness (**Claim 74**). Note page 8, 1st full par; of OA dated May 19, 2009

However, the Examiner alleged that a POSA would modify Chan with a swelling agent of

Belli in order to achieve the 2nd layer based on polyethylene mix and a swelling agent of the Appellants' dry water resistant coaxial cable.

Appellants disagree.

First, there is no motivation or suggestion to substitute XLPE of Chan et al. for LDPE of the presently claimed invention. As discussed above, XLPE is **not functionally equivalent** to LDPE. Moreover, there is no suggestion, motivation or guidance to one of ordinary skill in the cited prior art which "expanded polymer" should be selected in order to accomplish the desired results of the presently claimed invention; which "expanded polymer" would be critical to one of ordinary skill in the art such that it would function as employed in the presently claimed invention.

Second, the Examiner alleged that with respect to Claim 71, Belli teaches the diameter of the insulation layer may be 14 mm. Col.9, line 54. See OA dated May 19, 2009 at page 9, lines 3-4. Upon reading Belli at col. 9, line 54, it discloses as follows:

Example 5

A medium voltage cable was produced using polymer composition of Example 4, according to the structure reported in Figure 1.

The cable core consisted of an aluminum conductor having a 150 mm² cross section and a 14.0 mm diameter, coated with the following layers, **crosslinked** with peroxide on a catenary line:

An inner semiconductive layer; product LE 0595 from Borealis (0.6 mm thick)

An insulating layer made of **XLPE** (4.65 mm thick).

The expanded layer was deposited on this core (having an outside diameter of about 25.3 mm by extrusion according to technique described in Example 3.

First, it is submitted that the diameter data that was listed in Belli refers to the cable core itself (aluminum conductor). In contrast, in the presently claimed invention, the copper plated aluminum wire has a uniform circular cross section of 3.15 ± 0.03 mm diameter.

Second, it is submitted that the base material in Example 3 is a **thermoplastic elastomer**. Moreover, the insulating layer is XLPE, (LE 0595 from Borealis is XLPE). The 2nd layer in the presently claimed invention is either low, medium or high density polyethylene. As discussed above, thermoplastic elastomer is not functionally equivalent to LDPE of the presently claimed invention.

Third, the 2nd layer, the polyethylene mix is in combination with the swelling agents selected from azodicarbodiimide, p-toluene sulphonylhydrazide or 5-phenyltetrazol when applied onto the

core conductor in accordance with Claim 71 offers a 13.0 ± 0.10 mm diameter. In contrast, it is submitted that Belli et al. discloses the aluminum conductor (6) by itself as having a 14.0 diameter. This is "totally different" from the expanded layer (5) of Belli.

Fourth, The Examiner alleged that with respect to Claim 72, Belli teaches that the outer conductor may be a material formed as a cylinder pipe (i.e., metallic tube) which can be longitudinally welded or edges overlapped. Col. 4, lines 55-60; wherein shield (6) may have an external conductor thickness of at least 0.2 mm and a diameter of 14.2 mm (Col. 10, lines 12-15). Note page 9, lines 4-6 of OA dated May 19, 2009.

Belli discloses at col. 4, lines 55-60 as follows:

The conductor (1) generally consists of metal wires preferably copper or aluminum, which are braided together using conventional techniques.
The metal shield (6) usually made of aluminum or copper or also lead, consists of *continuous metal tube or of a metal sheet shaped into a tube* and welded and sealed using an adhesive material so as to make it watertight.

From the above, it is submitted that there is no disclosure or suggestion in Belli regarding the use of an external conductor formed by a tape made of aluminum or copper alloy welded with edges overlapped with a thickness of 0.34 mm and diameter on the pipe is 13.7 ± 0.10 mm. There is no suggestion to one of ordinary skill in the art regarding the external conductor made of a tape of aluminum or copper alloy in Belli et al.

Furthermore, Belli discloses at col. 10, lines 12-15 as follows:

The so obtained cable was then wrapped with a lacquered aluminum stip [sic] (thickness 0.2 mm) using an adhesive to bond the overlapping edges. Eventually, an external sheath made of *PVC* was applied by extrusion.

It is submitted that Belli discloses a cable wrapped with lacquered aluminum which employs an adhesive. The adhesive employed in the presently claimed invention was with the 1st layer polyethylene combination.

Lastly, there is no motivation to "pick and choose" from an infinite number of "expanded layer" disclosed in Belli et al. *In re Albrecht, supra*

Third, the cable elements of Belli are open ended and required "expanded layer" to have predetermined degree of expansion of between 5% and 500% which was not encompassed by Appellant's cable. The *only* teaching linking (nexus) the structure of Chan, Goehlich and Belli is

found in the presently claimed invention. Moreover, even if the references did indicate that such modification might be tried, an *obvious-to-try* standard would be indicated, which is clearly *not* a sufficient basis for the rejection. It is submitted that the specified claimed modifications must be specifically motivated or suggested by the prior art.

With respect to Claim 69 directed to the dry coaxial cable wherein the core conductor is copper plated aluminum wire, with a uniform circular cross section of 3.15 ± 0.03 mm diameter. Appellants submit that there is no disclosure or suggestion in the cited prior art regarding this specific cross section. It is submitted that the embodiments of Claim 69 is patentable over the cited prior art.

With respect to Claim 70 directed to the dry coaxial cable wherein the adhesive component is chosen between ethylene acrylate acid or ethylene vinyl acid permitting better adherence and water resistance between the core conductor and the dielectric element, Appellants submit that there is no disclosure or suggestion in the cited prior art regarding ethylene acrylate acid or ethylene vinyl acid. It is submitted that the embodiments of Claim 70 is patentable over the cited prior art.

As conceded by Examiner in OA dated May 19, 2009 at page 6, 1st paragraph, Chan et al does not disclose an adhesive, more specifically ethylene acrylate acid or ethylene vinyl acid. In order to establish obviousness, the Examiner combined Chan with Goehlich to show adhesives are well known in the art. The Office Action cited that adhesive component may be selected from ethylene acrylate (Col. 5, lines 8-20)

Upon review of Goehlich at Col. 5, lines 8-20, the disclosure is as follows:

“Such adhesives can be each adhesive, which is resistant against the substance to be detected (like water) and which is adhesive to the used material of the inner and/or outer sheath, like adhesives based on for example acrylate polymers, methacrylate polymers, polyurethans, silicones, epoxy resins and the like. In case of using a double sided adhesive material the two sheaths are bonded together and are able to seal the interstice between the cable sheaths as well as to allow to increase the friction or bonding between the sheaths. "Self adhesive material" in the sense of this invention includes material which can also be made adhesive by a following extrusion process for extruding the outer sheath.”

Appellants disagree. Of the list of adhesives, ethylene acrylate was not mentioned. Rather, a broad *infinite* disclosure list of adhesives was listed.

Moreover, Goehlich broadly employs an **infinite list** of “structured material” as follows:

a) swellable material, self adhesive, tape, sputtered adhesive and sealing material. Note cols. 5-6. Of all the enumerated “swellable material”, a preferred embodiment was the use of sputtered adhesive and sealing material.

With respect to Claim 71 directed to the dry coaxial cable wherein the second polyethylene film applied onto the core conductor shows better watertightness to the swellable dielectric improves its superficial appearance and offers a 13.0 ± 0.10 mm diameter, Appellants submit there is no disclosure or suggestion in the cited prior art regarding the specific diameter. The second layer is physically expanded by gas injection and contains a swelling agent. The cellular expansion polymer lowers the dielectric constant through the reduction of polymer mass per length time; the swelling agent controls the swelling material. It is submitted that the embodiments of Claim 71 is patentable over the cited prior art.

With respect to Claim 72 directed to the dry coaxial cable wherein the external conductor is formed by a tape made of aluminum or copper alloy or mixture thereof is formed in a cylindrical pipe and can be longitudinally welded, extruded or the edges can be overlapped and it has a thickness of 0.34 mm and the diameter on the pipe is 13.7 ± 0.10 mm diameter, Appellants submit there is no disclosure or suggestion in the cited prior art regarding the specific diameter. It is submitted that the embodiments of Claim 72 is patentable over the cited prior art.

With respect to Claim 73 directed to the dry coaxial cable wherein the water penetration protective element consists of swellable tapes placed helically, annularly or longitudinally, Appellants submit there is no disclosure or suggestion in the cited prior art regarding the specific embodiment of the water penetration protective element. It is submitted that the embodiments of Claim 73 is patentable over the cited prior art.

With respect to Claim 74 directed to the dry coaxial cable wherein the moisture protection elements have an adsorption speed of ≥ 15 ml/g per minute and their absorption capacity is over 30 ml/g, Appellants submit there is no disclosure or suggestion in the cited prior art regarding the specific adsorption speed. It is submitted that the embodiments of Claim 74 is patentable over the cited prior art.

With respect to Claim 75 directed to the dry coaxial cable wherein the external cover is made of medium density polyethylene and has a diameter on cover of $15.5 \text{ mm} \pm 0.10 \text{ mm}$ with a

0.67 mm \pm 0.02 mm thickness, Appellants submit there is no disclosure or suggestion in the cited prior art regarding the specific diameter of the external cover. It is submitted that the embodiments of Claim 75 is patentable over the cited prior art.

Appellants submit that although the court in *In re Aller*, 105 USPQ 233 (CCPA 1955) sets out the rule that the discovery of an optimum value of a variable is normally obvious, courts have held that there are exceptions to this rule in cases where the results of optimizing a variable which was known to be result effective, were unexpectedly good. See *In re Wymouth*, 182 USPQ 290 (CCPA 1974); *In re Saether*, 181 USPQ 36 (CCPA 1974). Another exception is one in which the parameter optimized was *not* recognized to be a result effective variable. *In re Antoine*, 195 USPQ 6 (CCPA 1977). It further stated that §103 directs attention to the invention "**as a whole**" which includes not only to the subject matter which is literally recited in the claim in question but also those properties of the subject matter *and* are disclosed in the specification and claimed with the transitional phrase "consisting of".

In this case, the invention "as a whole" which includes optimum values such as the uniform circular cross section of 3.15 ± 0.03 mm diameter (**Claim 69**); 13.0 ± 0.10 mm 2nd layer diameter(**Claim 71**); external conductor thickness of 0.34 mm and the diameter on the pipe is 13.7 ± 0.10 mm diameter (**Claim 72**); adsorption speed and capacity of > 15 ml/g per minute and over 30 ml/g (**Claim 74**); the external cover diameter on cover of $15.5 \text{ mm} \pm 0.10 \text{ mm}$ with a $0.67 \text{ mm} \pm 0.02 \text{ mm}$ thickness (**Claim 75**), provide distinct unexpected properties and advantages over the cited references. These properties were not suggested in the cited prior art.

Appellants have presented arguments and evidence in their response to establish that the Examiner has failed to establish a *prima facie* case of obviousness. Appellants submit that the Examiner has failed to fully address and consider such arguments and evidence as directed by law. Appellants have amended the claims to "consisting of."

In order to support a rejection under 35 U.S.C. §103, a basis for a suggestion to make the claimed invention must be found in the prior art. In addition, one of ordinary skill in the art would have had to have a reasonable expectation of success of making the claimed invention. It is submitted that neither of these elements are found in the art cited by the Examiner.

Appellants request the Board to reconsider upon review of all the evidence whether one of ordinary skill in the art would have been motivated to use an "adhesive" from an **infinite** list

of “structured material” in Goehlich (prefers sputtered adhesive and sealing material) and that they would have been able to do so with a reasonable expectation that the cable would function effectively without significantly affecting the other components contained therein.

The Examiner urged that it would have been obvious to one of ordinary skill in the art at the time the invention was made to employ an adhesive from Goehlich in the cable of Chan et al. and arrive at the presently claimed invention. The Examiner has not shown prior art that provided motivation or suggestion to incorporate the preferred adhesive.

Furthermore, an ability of one of ordinary skill in the art to incorporate the adhesive of Goehlich in the cable of Chan et al. does not lead the artisan to achieve the presently claimed invention because there are several factors to be considered, e.g., a) design of the cable, e.g., choice of elements or layers; b) choice of swellable materials or adhesive; or c) use of encapsulation jacket.

As discussed above, it is an on-going goal in the art to prevent water penetration in the cable art. It is not a matter of incorporation or substitution of an element or layer. For example, Belli et al. disclose different configurations, variations and designs of cables where breakages, and piercings can occur, as well as, rupture problems. Chan et al. disclose that water swellable materials provide a number of disadvantages, e.g., cause flash fire, eye irritation or unsafe work areas. Thus, Appellants refute the Examiner’s contention that it would be obvious to make substitutions or incorporations in a specific cable configuration and arrive at the Appellants’ present invention.

These problems in the prior art can not be solved by simple substitution without experimentation. Rather, it is submitted that the specified claimed modifications in the presently claimed invention must be specifically motivated or suggested by the prior art.

Moreover, even if the references did indicate that such an incorporation may be tried, an “obvious-to-try” standard would be indicated, which is clearly not a sufficient basis for the rejection. The specified claimed modifications must be specifically motivated or suggested by the prior art.

The Appellants will present arguments to show that the Examiner has not met his burden to maintain a prima facie case of unpatentability of the inventions claimed here. The initial burden of presenting a prima facie case of unpatentability based, inter alia, on the prior art rests

on the Examiner. *In re Oetiker*, 24 USPQ 2d 1443 (Fed. Cir. 1992). Assuming the burden is met, the burden then shifts to the Appellant to come forward with evidence or argument. Once the Appellant does so, "patentability is determined on the totality of the record, by a preponderance of evidence with due consideration to persuasiveness of argument." *Id.* (emphasis added, citations omitted).

A further discussion which follows will establish that Appellants have provided ample support for patentability of the subject claims. The Examiner has not adequately responded to the Appellants' arguments and evidence to maintain the basis for unpatentability. In a concurring opinion to *In re Oetiker* decision, Justice Plager stated "[t]he burden is on the Commissioner to establish that the Applicant is not entitled under the law to a patent . . . [even] if, as a matter of law, the issue is in equipoise, the Applicant is entitled to the patent." *Id.* (citations omitted, emphasis added).

It is submitted that the Examiner has not shown the proper motivation to combine the cited prior art in order to arrive at the presently claimed invention. The Examiner merely isolated specific teachings from each of the cited prior art in order to provide a blueprint of the claimed invention.

Appellants have presented arguments and evidence in their response to establish that the Examiner has failed to establish a *prima facie* case of obviousness. Appellants submit that the Examiner has failed to fully address and consider such arguments and evidence as directed by law.

In *In re Vaeck*, 20 USPQ2d 1438 (Fed. Cir. 1991), the Federal Circuit set forth the standard for *prima facie* obviousness in a method-related opinion, citing *In re Dow Chemical Co.*, 837 F.2d 469, 473, 5 USPQ2d 1529, 1531 (Fed. Cir. 1988). The Court stated that a proper *prima facie* obviousness rejection requires consideration of two factors:

- 1) whether the prior art would have suggested to one of ordinary skill in the art that they should make the claimed composition or device, or carry out the claimed process; and
- 2) whether the prior art would also have revealed that in so making or carrying out, those of ordinary skill would have a reasonable expectation of success Both the suggestion and

the reasonable expectation of success must be founded in the prior art, **not in the applicant's disclosure.** (emphasis added)

In order to support a rejection under 35 U.S.C. §103, a basis for a suggestion to make the claimed invention must be found in the prior art. In addition, one of ordinary skill in the art would have had to have a reasonable expectation of success of making the claimed invention. Neither of these elements are found in the art cited by the Examiner.

Appellants request the Board to determine upon review of all the evidence whether one of ordinary skill in the art would have been motivated to a) select, pick or choose an adhesive from an infinite list of "structure material" in Goehlich which is directed to a water detecting device; incorporate a specific adhesive in the cable of Chan et al which comprises a plurality of CN wires which prevent water migration; b) select a specific adhesive and determine which layer or part of the cable should be mixed with the adhesive; c) determine the amount of the adhesive and when the layer coating should be applied and that they would have been able to do so with a reasonable expectation that the cable would function effectively to i). permit high speed digital signal transmission without interfering at all with the voice service signal; ii) highly resistant to diaphony; and iii) provide tensile strength, i.e., increase of installation span distance.

1. **The rejection of the claims under 35 U.S.C. § 103 should be withdrawn because the cited art does not suggest or motivate the claimed invention.**

The Examiner urged that it would have been obvious to one of ordinary skill in the art of cables at the time invention was made to modify the cable of Chan et al. by incorporating an adhesive from Goehlich and arrive at the claimed dry, water resistant coaxial cable of the present invention.

The Examiner alleged in his Office Action dated May 19, 2005 as follows:

"Chan discloses a dry water resistant coaxial cable which provides improved protection against migration of water (Col. 1, lines 5-16). With respect to claim 11, Chan discloses a cable (Fig. 3) comprising a metal core conductor element (1), a dielectric element (2-4) around the core conductor (1) on the first layer (2, col. 5, lines 15-25) and a third layer (4) comprising a reinforcement layer on second layer (3, col. 5, lines 15-25), a second external conductor (5a) surrounding the dielectric element (6) comprising a water penetration protection element (i.e. swellable yarn) and a protective element (7) surrounding

the second conductor element (5a, col. 5, lines 36-46).

However, upon reading of the cited columns in Chan, there was no disclosure or suggestion regarding a dry, water resistant coaxial cable. Rather, Chan et al. discloses at col. 1, lines 5-16 a compound with trademark STRANDBLOCK® was used to prevent migration of moisture. These properties of the presently claimed invention as provided by the Examiner were pulled selectively from the **Appellant's own claims and specification**. The Examiner used the claims of the present invention as a blueprint for his rejection.

The Examiner has not shown prior art that provides motivation or suggestion to incorporate a specific adhesive from a multitude of "structured materials in Goehlich or a infinite list of "Expanded polymer" in Belli and incorporate these specific polymers in the cable of Chan et al. which employ a "plurality of concentric neutral wires."

As discussed above, Goehlich **comprises** an infinite list of "structured material" between the inner cable sheath and the outer sheath to allow a detectable substance. The invention of Goehlich centers on "structured material."

Moreover, Chan is directed to electric power cables having a **plurality of CN wires** applied helically over the cable core as a metallic ground shield which is then protected with a protective polymeric jacket. As discussed above, the configuration of Chan is totally different from that of the presently claimed invention. The CN configurations are required in order to prevent water penetration. In contrast, the presently claimed invention does not encompass or require a "plurality of" CN wires to prevent water penetration.

Further, the ability of one of ordinary skill in the art to prepare the cable of the present invention does not lead the artisan to achieve the presently claimed cable because there are several factors to be considered, e.g., 1) position or arrangement of the layer of the swelling agent on the cable, 2) which part or parts of the cable should be mixed with the swelling agent, 3) how and when should the cable be coated or the means to coat the components of the cable; and 4) what would be an optimum diameter, thickness or adsorption capacity. Moreover, even if the references did indicate that such a swelling agent might be tried, an *obvious-to-try* standard would be indicated, which is clearly not a sufficient basis for the rejection. The specified claimed modifications must be specifically motivated or suggested to one ordinary skill in the art

The Examiner has not shown prior art that provides motivation or suggestion to incorporate a water penetration protective element in the cable of Chan and arrive at the cable design of the presently claimed invention. In addition, the Examiner has not shown the motivation or suggestion to choose/select a specific polymer from a “multitude” or infinite list of polymers. The Examiner has not demonstrated that if these “plurality of concentric neutral wires” were employed, the properties of the resulting cable would be materially affected in the presently claimed invention having the limitation “consisting of.”

It is impermissible within the framework of 35 U.S.C. §103 to *pick* and *choose* from a reference only so much of it as will support a conclusion of obviousness to the exclusion of other parts necessary to a full appreciation of what the reference fairly suggests to one skilled in the art. *Bausch & Lomb, Inc. v. Barnes-Hind/Hydrocurve, Inc.*, 230 USPQ 416 (Fed. Cir. 1986). Courts have long cautioned that consideration must be given “where the references diverge and teach away from the claimed invention”. *Akzo N.V. v. International Trade Commission*, 1 USPQ 2d 1241, 1246 (Fed. Cir. 1986).

Rejections on obviousness grounds **can not** be sustained by mere conclusory statements, instead there must be some articulated reason with rational underpinning to support legal conclusion of obviousness. *KSR International Co. v. Teleflex Inc.* 550 U.S. 398 (2007). The Court in *KSR* stated that “a patent composed of several elements is not proved obvious merely by demonstrating that each of its elements was, independently known in the prior art. *KSR* supra.

The Examiner must present a convincing line of reasoning supporting a rejection.
MPEP2144.

In the present instance, the Examiner improperly selected disclosures from the cited prior art without finding the motivation or suggestion necessary for one of ordinary skill in the art to combine them.

The Examiner alleged that based on the teaching of Goehlich, there clearly exists a motivation to modify Chan with adhesive of Goehlich since Chan is concerned with preventing migration of water. Note page 16, lines 1-6 of Office action.

Appellants disagree. As discussed above, Chan et al does not require any modification because the intent of Chan et al. was to modify the prior art by employing “a plurality of” CN wires to prevent water migration. See col. 1, lines 1-15; lines 55-59. Goehlich was concerned

with detecting detectable substance **using a sensor**. As discussed above, the adhesive in Goehlich is from an infinite list of “structured material”. There is no guidance to one of ordinary skill regarding the selection of a specific adhesive for mixing with the polymer. There is no guidance on which “structured material” should be selected, which “structured material” is critical. Moreover, Goehlich discloses in specific examples the use of “sputtered adhesive” and sealing material. It is submitted that there is no motivation or suggestion to one of ordinary skill in the art which “adhesive” should be selected from an **infinite list** of “structured material” in order to accomplish the desired result. Finally, Appellants’ invention as claimed has a limitation “consisting of” which excludes a sensor, or “structured material” such as sputtered adhesive or sealing material which would affect the resulting properties of the presently claimed invention.

The Examiner cited Hughley, US Patent 5,043,538 to demonstrate the external conductor (16) being helically wound around the conductor core. It is submitted that the presently claimed invention is different and unobvious over Hughley. The claims of Hughley is “open ended.” There is no disclosure or suggestion in Hughley regarding a 1st layer of LDPE mixed with adhesive, 2nd layer of expanded polyethylene and swelling agent; and optionally, a 3rd layer having same properties as 1st layer. Moreover, in Hugley, the metal foil barrier is between about 3 mils and about 10 mils thick. It is well known in the art that 1 mm is equal to 39.37 mils. Thus, the external conductor of the presently claimed invention is 13.7 mm which when converted is equal to 539.37 mils. Similarly, Hughley employs **elastomers** and the preferred embodiment is a plurality of wires as a shield encapsulated by a plastic material (Note col. 4) which are not encompassed by the presently claimed invention. The properties of the dry, water resistant cable would not be materially affected if these components were not employed.

The presently claimed invention accomplished the use of polyethylene (LDPE) mixed with an adhesive such as ethylene acrylate. The cited prior art taken together did not accomplish the use of low density polyethylene (LDPE), medium density polyethylene (MDPE) or high density polyethylene (HDPE). Rather, most of the cited prior art employed **thermoplastic elastomers** such as XLPE, EVA and EPR. These elastomers are not functionally equivalent to polyethylenes. These thermoplastic elastomers would affect the resulting properties of the presently claimed invention containing the limitation “consisting of”.

In summary, none of the cited references supplies the requisite motivation or suggestion to prepare a cable of the presently claimed invention with modified tensile strength, highly resistant to diaphony, highly crush and moisture resistant, and provides high speed digital services link, as well as analog services. It is submitted that the specified claimed modifications must be specifically motivated or suggested by the prior art.

a. The cited art fails to provide a motivation or suggestion because the invention contains elements nowhere found or suggested in the prior art.

Appellants submit that Belli provides **no intention** to provide a cable without the use of fillers. Nothing in Belli discloses or suggests the presently claimed invention regarding the use of a swellable polymer. If anything, Belli **taught away** from the claimed invention.

In contrast, the present invention **required** a swelling agent without the use of a filler. One of the goals of the presently claimed invention is to **avoid the use of fillers**. Moreover, the presently claimed invention uses the limitation “consisting of.” Without filler, the presently claimed invention would provide a cable having high speed digital signal transmission *without* interference from voice service signals and use of additional electronic circuits to separate signals.

Moreover, Belli’s problems are directed to high voltage and medium voltage transmission. Thus, even if Belli was considered, the disclosures would not suggest the invention to one skilled in the art. If the prior art does not appreciate the existence of the problem solved by the invention, the Appellants’ recognition of the problem is in itself, **strong evidence of non-obviousness of the present invention**. *In re Nomiya*, 184 USPQ 607 (CCPA 1975).

Combining prior art references without evidence of such a suggestion, teaching or motivation simply takes inventor disclosure as a blueprint for piecing together prior art to defeat patentability is the essence of hindsight. *In re Dembiczek*, 175 F.3d 994 (Fed. Cir. 1999).

b. The cited prior art fails to provide a motivation or suggestion because the cited prior art taught away from the present invention.

A critical issue is whether Belli constituted relevant prior art. Belli discloses the use of

fillers which the presently invention avoids. A relevant prior art is defined by the nature of the problem confronting the would be inventor.

“When determining patentability of a claimed invention which combines two known elements, the question is whether there is something in the prior art to suggest the desirability, and thus, the obviousness of making the combination” *Ecolchem Inc. v. Southern Cal. Edison Co.*, 227 F.3d 1361, 1372 (Fed. Cir. 2000), *cert. denied*, 532 U.S. 974 (2001) quoting *In re Beattie*, 974 F.2d 1309, 1311-1312 (Fed. Cir. 1992) quoting *Lindemann Maschinenfabrik GmbH v. American Hoist & Derrick Co*, 730 F.2d 1452, 1462 (Fed. Cir. 1984)).

From the above caselaw, it is submitted that there must be something in the prior art to suggest the “desirability” of using a swelling agent of Belli in the cable of Chan. Belli is directed to swelling agent which contain fillers. Goehlich et al. is directed to structured materials. Moreover, it discloses a multitude of radiation cured polymers, a plethora of a combination of multitude of polymers.

The Federal Circuit’s decisions on obviousness follow *United States v. Adams*, 383 U.S. 39 (1966). In *Adams*, the patented product (a battery) consisted of a combination of old elements that were well known in the prior art 383 U.S. at 51. The Court nonetheless held that the patented battery was nonobvious. The Court held that known disadvantages in old devices which would naturally discourage the search for new inventions may be taken into account in determining obviousness.” 383 U.S. at 52. The Court also noted that “[i]f such a combination of [old battery elements] is novel, the issue is whether bringing them together as taught by Adams was obvious in light of the prior art.” 383 U.S. at 50. The Federal Circuit has followed the Court’s holding in *Adams*. See e.g., *Kahn v. General Motors Corp.*, 135 F.3d 1472 (Fed. Cir. 1998, *cert. denied*, 525 U.S. 875 (1998)) (“In determining obviousness, the invention must be considered as a whole”); *In re Gurley*, 27 F.3d 551 (Fed. Cir. 1994) (“a reference will teach away if it suggests that the line of development flowing from the reference’s disclosure is unlikely to be productive of the result sought by the Applicant”) citing *Adams*, 383 U.S. at 52.

A person of ordinary skill in the art not only should have had some motivation to combine the prior art teaching but some motivation to combine prior art teaching in a particular manner claimed. *In re Kotzab*, 217 F.3d 1365 (Fed. Cir. 2000).

It is submitted that the Examiner improperly combined the teaching of Chan with Goehlich and Belli et al. There is no disclosure, teaching or suggestion in Goehlich, Chan or Belli et al. regarding the position, layering or coating of the cable with the swelling agent/adhesive. There is no disclosure or suggestion in Belli, Goehlich or Chan regarding the parts of the cable that should be coated with the swelling agent/adhesive. There is no disclosure or suggestion on Belli, Goehlich or Chan regarding how the coating of swelling agent should be applied. There is no disclosure or suggestion in Goehlich, Chan or Belli regarding the unexpected properties achieved by the cable of the presently claimed invention. There is no suggestion or disclosure regarding the use of plurality of concentric neutral wires in the presently claimed invention. The prior art which teaches away from the combination of elements recited in the claimed invention does not support a *prima facie* obviousness of that claim. *Mentor H/S Inc. et al. v. Medical Device Alliance et al.*, 244 F.3d 1365, 1377 (Fed. Cir. 2001)

From the above, the Examiner has not shown any prior art to show a motivation or suggestion in the prior art to show the incorporation of the teaching of Belli or Goehlich in the disclosure of Chan and arrive at the presently claimed invention. In accordance with *In re Oetiker, supra*, the Examiner has not met the requisite burden of proof as required by a *prima facie* case of obviousness.

RESPONSE TO ARGUMENT

As a preliminary matter, it should be pointed out that **similar claims in the presently claimed application have issued in Europe as EP 1457996 on March 21, 2007.**

The Examiner issued 24 pages of Office Action dated May 19, 2009. In all of 24 pages, it should be emphasized that the **only moment** in the Office Action, the Examiner briefly mentioned the Appellants' transitional phrase claim limitation "**consisting of**" was on page 15, lines 2-4.

Moreover, on page 22 of the Office Action dated May 19, 2009, it should be clarified that although the Board of Appeals has stated that the Examiner established the obviousness of the claims in a **previous Appeal** regarding this application, **the conclusion was based on a different set of claims before the Board of Appeals at that time. Therefore, the Order of the Board of Appeals dated July 15, 2008 on should not be confused with the presently amended claimed invention with the transitional phrase "consisting of."**

Moreover, in the opinion dated July 15, 2008, Appellants have pointed out in their arguments

dated September 15, 2008 that the Board of Appeal opinion **did not address** the issue of "picking and choosing" within the disclosure of Belli or Goehlich or Chan by the Examiner in rejecting the claims of the appealed claims.

Further, the Board of Appeal opinion depended on the Examiner's Answer without verifying the cited columns and lines by the Examiner. For example, the opinion cited as follows:

"Belli teaches that outer conductor (6) may be a material formed as a cylindrical pipe (i.e., metallic tube) which can be longitudinally welded to the edges overlapped [(Col. 4, lines 55-60), wherein the shield (6) may have an external conductor thickness of at least 0.2 mm and a diameter of 14.2 mm (Col. 10, lines 12-15:" (Ans.9). However, upon reading Belli, at col. 10, lines 12-15, nowhere shows the description that the external conductor having a thickness of 0.2 mm and a diameter of 14.2 mm. Moreover, Belli is directed to the use of layer of expanded polymer material (5) placed under metal shield; characterized in that the layer of expanded polymer material is semiconductive and includes water swellable material wherein the expanded layer material has a **degree of expansion between 5% and 500%**. The cable has an **expanded layer** having a **predetermined degree of expansion** so as to ensure elastic absorption of radial forces of thermal expansion and contraction of cable and maintain semiconductive properties. These components and properties would affect the properties of presently claimed invention.

Moreover, the Board of Appeals opinion **did not address** the issue that Belli teaches away from the present invention. Belli teaches the *use of* "FILLERS". In contrast, the present application does not employ fillers. This is the main objective of the present application, i.e. avoid FILLERS.

The Board of Appeals did not address the obviousness of Claim 74. Appellants submit that the limitation of claim 74 which recited "the water penetration protective element has an absorption speed of about 15 ml/g per minute and an absorption capacity of more than 30 ml/g." is **unobvious** over the cited prior art.

At the outset, Appellants have amended the broad claim 68 as follows:

A dry, water resistant coaxial cable **consisting of**: a metal core conductor element, a dielectric element around the core conductor based on three layers, the first layer being applied onto the conductor as a uniformly thick film based on low density polyethylene mixed with a vinyl or acrylic adhesive, the second layer being based on an expanded polyethylene mix consisting of low density polyethylene or mixture of low, medium and high density

polyethylenes and a swelling agent selected from azodicarbonamide, p-toluene sulphonylhydrazide, or 5-phenyltetrazol, and optionally a reinforcement layer of the same characteristics as the first layer; wherein it has a second external conductor element formed by a tape made of an aluminum or copper alloy or combined with other elements and surrounding said conductor consisting of a water penetration protective element keeping it dry and based on one or several swellable fibers or tapes formed by polyester threads or other swellable fibers; and the protective cover based on low, medium, high density polyethylene or a combination thereof.

It is submitted that the unobviousness of the present invention over the cited prior art are as follows:

- a) 1st and 3rd layers of the present invention are LDPE mixed with acrylic adhesive.
- b) The 2nd layer is LDPE, MDPE, HDPE with a swelling agent selected from azodicarbodiimide, p-toluene sulphonylhydrazide, or 5-phenyltetrazol;
- c) The unobvious configuration/design and structure of the layers of the dry, water resistant coaxial cable of the present invention.
- d) 2nd conductor is a aluminum or copper alloy tape; tape formed from polyester threads or swellable fibers.
- e) Protective cover made of LDPE, HDPE or MDPE;
- f) copper plated aluminum wire, with a uniform circular cross section of 3.15 ± 0.03 mm diameter. (Claim 69)
- g) second polyethylene film is 13.0 ± 0.10 mm diameter (Claim 71); tape made of aluminum or copper alloy or mixture thereof has a thickness of 0.34 mm and the diameter on the pipe is 13.7 ± 0.10 mm diameter. (Claim 72). moisture protection elements have an adsorption speed of ≥ 15 ml/g per minute and their absorption capacity is over 30 ml/g. (Claim 74) and the external cover is made of medium density polyethylene and has a diameter on cover of $15.5 \text{ mm} \pm 0.10 \text{ mm}$ with a $0.67 \text{ mm} \pm 0.02 \text{ mm}$ thickness.

From the above limitation of the claims, it is submitted that the presently claimed invention is unobvious over the cited prior art. The Examiner has not shown the diameter/thickness of protective cover, layer thickness; absorption speed, absorption capacity of the presently claimed invention. Moreover, if the other components were incorporated in the


claimed invention, the resulting properties would not be achieved.

CONCLUSION

Appellants have presented the above reasons why the claims are not rendered obvious by the cited references. Moreover, the limitation "consisting of" was ignored by the Examiner in reviewing the presently claimed invention. The resulting properties of the presently claimed invention would be affected if the proposed modification by the Examiner were incorporated. These modifications teach away from the presently claimed invention. Each of the arguments alone is sufficient to establish that a *prima facie* case of unpatentability has not been made. In combination, they present a compelling argument that the claims are patentable over the prior art. It is submitted that the Examiner has not presented sufficient arguments or reasoning to contradict the evidence provided by Appellants that the prior art fails to provide a suggestion for providing an improved dry water resistant coaxial cable and method of manufacture thereof with unexpected properties.

WHEREFORE, in light of the arguments and authorities presented above, reversal of the Examiner's action in rejecting claims 68-75 and allowance thereof are respectfully urged.

Respectfully submitted,



Carmen Pili Ekstrom
Reg. No. 34,981
Attorney for Appellants

LAW OFFICE OF CARMEN PILI EKSTROM
727 Sunshine Dr.
Los Altos, CA 94024
650 960-1936

Filed: December 24, 2009

CLAIMS APPENDIX

Claim 68 A dry, water resistant coaxial cable consisting of: a metal core conductor element, a dielectric element around the core conductor based on three layers, the first layer being applied onto the conductor as a uniformly thick film based on low density polyethylene mixed with a vinyl or acrylic adhesive, the second layer being based on an expanded polyethylene mix consisting of low density polyethylene or mixture of low, medium and high density polyethylenes and a swelling agent selected from azodicarbonamide, p-toluene sulphonylhydrazide, or 5-phenyltetrazol, and optionally a reinforcement layer of the same characteristics as the first layer; wherein it has a second external conductor element formed by a tape made of an aluminum or copper alloy or combined with other elements and surrounding said conductor consisting of a water penetration protective element keeping it dry and based on one or several swellable fibers or tapes formed by polyester threads or other swellable fibers; and the protective cover based on low, medium, high density polyethylene or a combination thereof.

Claim 69 The dry coaxial cable according to claim 68 wherein the core conductor is copper plated aluminum wire, with a uniform circular cross section of 3.15 ± 0.03 mm diameter.

Claim 70 The dry coaxial cable according to claim 68 wherein the adhesive component is chosen between ethylene acrylate acid or ethylene vinyl acid permitting better adherence and water resistance between the core conductor and the dielectric element.

Claim 71 The dry coaxial cable according to claim 68 wherein the second polyethylene film applied onto the core conductor shows better watertightness to the swellable dielectric improves its superficial appearance and offers a 13.0 ± 0.10 mm diameter.

Claim 72 The dry coaxial cable according to claim 68 wherein the external conductor is formed by a tape made of aluminum or copper alloy or mixture thereof is formed in a cylindrical pipe and can be longitudinally welded, extruded or the edges can be overlapped and it has a thickness of 0.34 mm and the diameter on the pipe is 13.7 ± 0.10 mm diameter.

Claim 73 The dry coaxial cable according to claim 68 wherein the water penetration protective element consists of swellable tapes placed helically, annularly or longitudinally.

Claim 74 The dry coaxial cable according to claim 73 wherein the moisture protection elements have an adsorption speed of ≥ 15 ml/g per minute and their absorption capacity is over 30 ml/g.

Claim 75 The dry coaxial cable according to claim 68 wherein the external cover is made of medium density polyethylene and has a diameter on cover of $15.5 \text{ mm} \pm 0.10 \text{ mm}$ with a $0.67 \text{ mm} \pm 0.02 \text{ mm}$ thickness.

IX EVIDENCE RELIED UPON

The evidence relied upon are as follows:

Chan et al. (U.S. 5,486,648)

Goehlich (U.S. 6,784,371)

Belli et al. (U.S. 6,455,769)

Hughley (U.S. 5,043,538)

www.wikipedia.org/wiki/XLPE

www.wikipedia.org/wiki/LDPE

www.wikipedia.org/wiki/polysaccharide

www.wikipedia.org/wiki/carboxymethylcellulose

www.wikipedia.org/wiki/acrylic

www.wikipedia.org/wiki/acrylate

X RELATED PROCEEDING INDEX

There are no related proceeding which will directly affect this appeal.